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LENOX CHINA  
POMONA, NEW JERSEY

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GROUNDWATER CORRECTIVE ACTION SYSTEM  
SEMI-ANNUAL REPORT  
JANUARY-JUNE 1992

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PROJECT #530-3  
NOVEMBER 1992

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## Introduction

Lenox has installed a groundwater corrective action system (GWCAS) at its Pomona site in accordance with the plans and specifications submitted to the DEPE in September 1991.

Part VIII, Section VII of the draft Discharge to Groundwater (DGW) permit requires Lenox China to conduct a semi-annual evaluation of the GWCAS at the Lenox facility in Pomona, New Jersey. On behalf of Lenox China, Inc., Eder Associates Consulting Engineers, P.C. (Eder) submits this evaluation report for the period of January 1992 through June 1992. This was the first six-month operating period since system start-up.

## Groundwater Corrective Action Description

The GWCAS was designed as a closed loop system and consists of an array of recovery wells to extract TCE-contaminated groundwater, a granular activated carbon (GAC) treatment unit, and two shallow injection trench fields upgradient of the recovery wells to return the treated groundwater to the aquifer.

The feasibility of the GWCAS was determined by conducting pilot-scale treatability and recharge tests in August 1991 with preliminary capture well calculations confirmed by controlled aquifer tests in December 1991. The permanent extraction well locations were based on aquifer test data analyses.

The total extraction rate of the GWCAS is approximately 250 gallons per minute. The extracted water is pumped through underground PVC piping to a dual-vessel GAC unit. After treatment, the water is discharged to one of two shallow injection trench fields at the southwest corner of the Lenox property. Use of the injection trench fields is alternated every three or four months to maintain recharge capability.

### Groundwater Elevation Measurements

Lenox performs a quarterly groundwater monitoring program at the Pomona facility, which includes measuring groundwater elevation and collecting groundwater samples from on-site monitoring wells. Groundwater elevation maps, prepared during the two most recent monitoring rounds (February and May 1992), are shown on Figures 1 and 2.

The groundwater elevation contour maps show that the groundwater at the site flows northeast. The zone of influence created by the six recovery wells is reflected by the shape of the groundwater elevation contour near Atlantic Avenue. Comparing the groundwater elevation contours with the TCE plume maps generated during the same time period (Figures 3 and 4), it is evident that the capture zone created by the extraction wells intercepts the full width of the TCE plumes.

The groundwater elevation contour maps also show an area of localized mounding created by the recharge system. The size and shape of the groundwater mound beneath the recharge area will vary as discharge alternates between recharge areas 1 and 2.

### TCE Plumes

The extent of the TCE plumes during the February 1992 and May 1992 sampling rounds is shown on Figures 3 and 4. The plumes are moving toward the extraction well system, and the area containing the highest TCE concentration in the north plume has been intercepted by the extraction well network.

The overall width of the TCE plumes has not increased during the past two sampling rounds, proving the effectiveness of the extraction wells in containing and capturing the plumes.

### Recovery System Pumping Rate

The average and maximum flow rates of the GWCAS are summarized in Table 1. Based on the average monthly flow rates measured by Lenox, the GWCAS extracted, treated, and recharged over 2,000,000 gallons of water during the first six months of 1992.

### GAC Unit Sampling

Lenox sampled groundwater from the GAC unit and analyzed the samples for TCE and iron. The samples were collected from the GAC unit's influent and effluent sample ports, and from the sample port between the two carbon vessels. The analytical results are shown in Table 2.

The analytical results show that the GAC unit effectively removes TCE from the groundwater. Moreover, TCE concentrations are reduced to below detection levels before the water enters the second carbon vessel. Elevated iron levels, unrelated to groundwater, were initially found in the GAC effluent during the December 1991 sampling round. The iron, associated with the carbon beds, was a temporary condition. Subsequent sampling has shown that the iron concentrations have decreased to below detection levels.

### Recharge Area

Two shallow recharge trenches were installed at the southwest corner of the property to recharge treated effluent from the GAC unit. Treated groundwater is alternately discharged to each recharge area every three to four months. After the first six month period since system start-up, there are no indications of reduced recharge capability, or increased hydraulic head.

## TABLES

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TABLE 1

GROUNDWATER CORRECTIVE ACTION SYSTEM FLOW RATES

Month (1992)	Average Flow (gpd)	Maximum Flow (gpd)
January	353908	373300
February	364996	382150
March	367890	376342
April	355287	379250
May	367937	374750
June	372617	379000



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TABLE 2

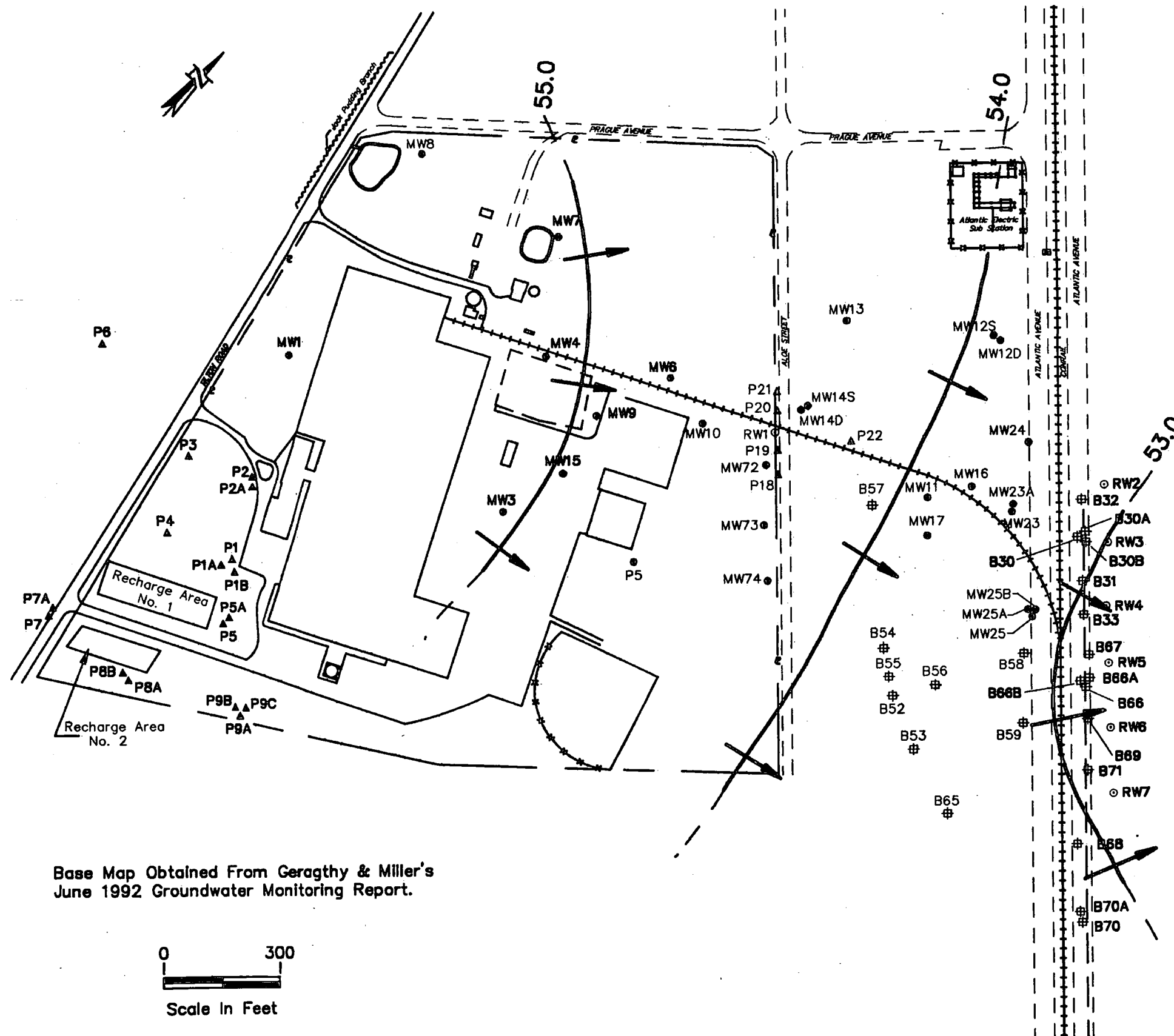
GAC UNIT SAMPLING RESULTS

Date	Influent (Untreated)		Effluent First Carbon Bed		Effluent Second Carbon Bed	
	TCE	Iron	TCE	Iron	TCE	Iron
12/24	35.6	0.24	<0.03	9.00	<0.03	4.00
2/18	23.0	NA	<0.03	NA	<0.03	NA
3/5	NA	NA	<0.03	NA	NA	NA
4/9	NA	NA	<0.50	NA	<0.50	NA
5/1	NA	NA	<0.50	<0.10	NA	NA
6/12	4.3	0.58	<0.50	<0.10	<0.50	<0.10
7/10	44.0	0.16	<0.50	<0.10	<0.50	<0.10

NOTES:

All results are in ug/l  
NA - not analyzed

## FIGURES



Base Map Obtained From Geraghty & Miller's  
June 1992 Groundwater Monitoring Report.

0 300  
Scale In Feet

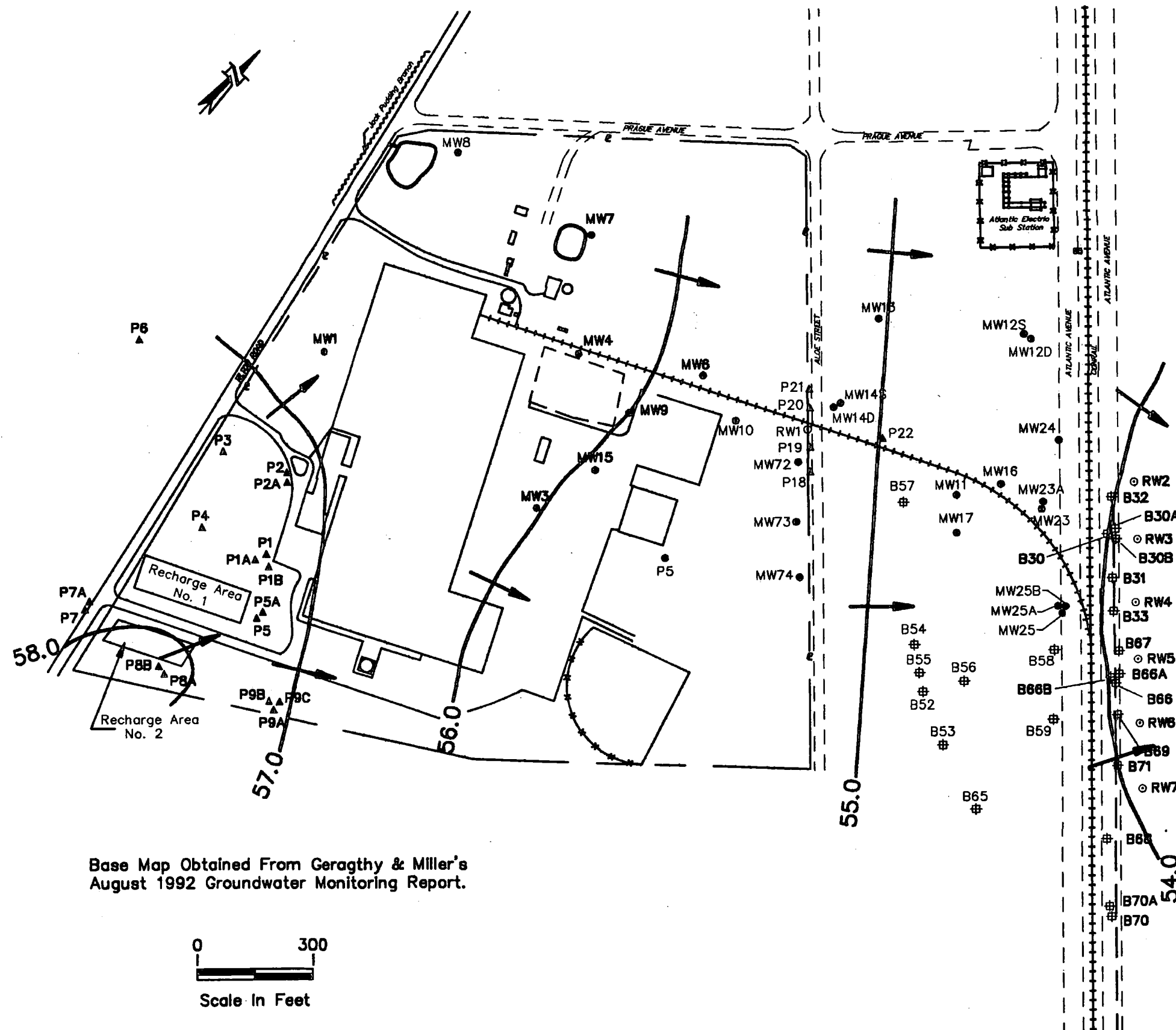
SK5303AE  
091192

# LEGEND-

- B85 # LOCATION OF MONITORING WELL
- RW5 # LOCATION OF RECOVERY WELL
- MW25 # LOCATION OF PIEZOMETER
- P9B # LOCATION OF WELL POINT
- 54.0 — LINE OF EQUAL WATER-LEVEL ELEVATION  
IN FEET ABOVE MEAN SEA LEVEL (DASHED  
LINES INFERRED)
- GENERALIZED DIRECTION OF THE HORIZONTAL  
COMPONENT OF GROUNDWATER FLOW

## GROUNDWATER ELEVATIONS AND GROUNDWATER FLOW FEBRUARY 10, 1992

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Base Map Obtained From Geraghty & Miller's  
August 1992 Groundwater Monitoring Report.

0 300  
Scale In Feet

SK5303AF  
091492

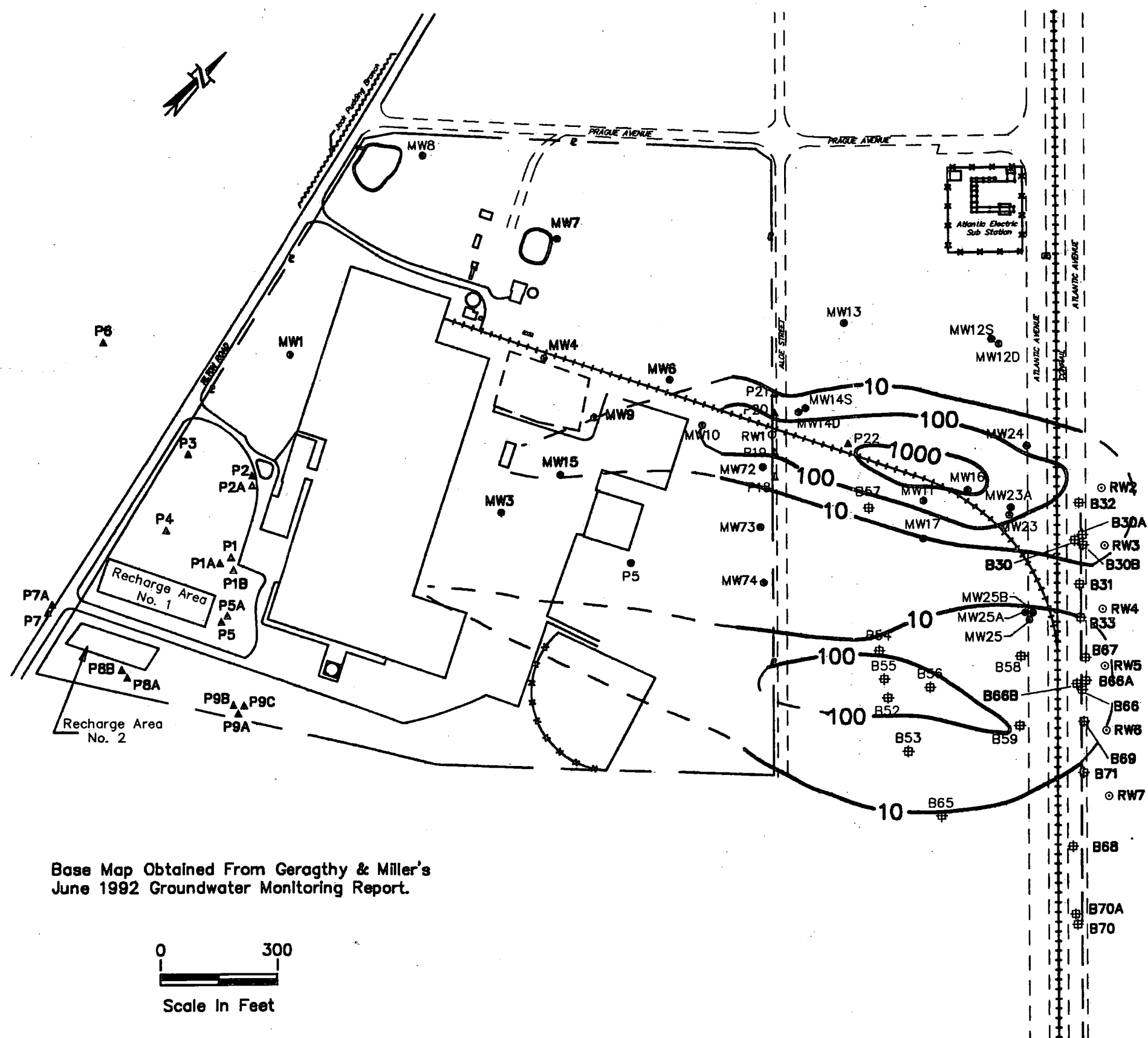
# LEGEND-

- B65 # LOCATION OF MONITORING WELL
- RW5 ○ LOCATION OF RECOVERY WELL
- MW25 ● LOCATION OF PIEZOMETER
- P9B ▲ LOCATION OF WELL POINT
- 54.0 — LINE OF EQUAL WATER-LEVEL ELEVATION  
IN FEET ABOVE MEAN SEA LEVEL (DASHED  
LINES INFERRED)
- GENERALIZED DIRECTION OF THE HORIZONTAL  
COMPONENT OF GROUNDWATER FLOW

## GROUNDWATER ELEVATIONS AND GROUNDWATER FLOW

MAY 11, 1992

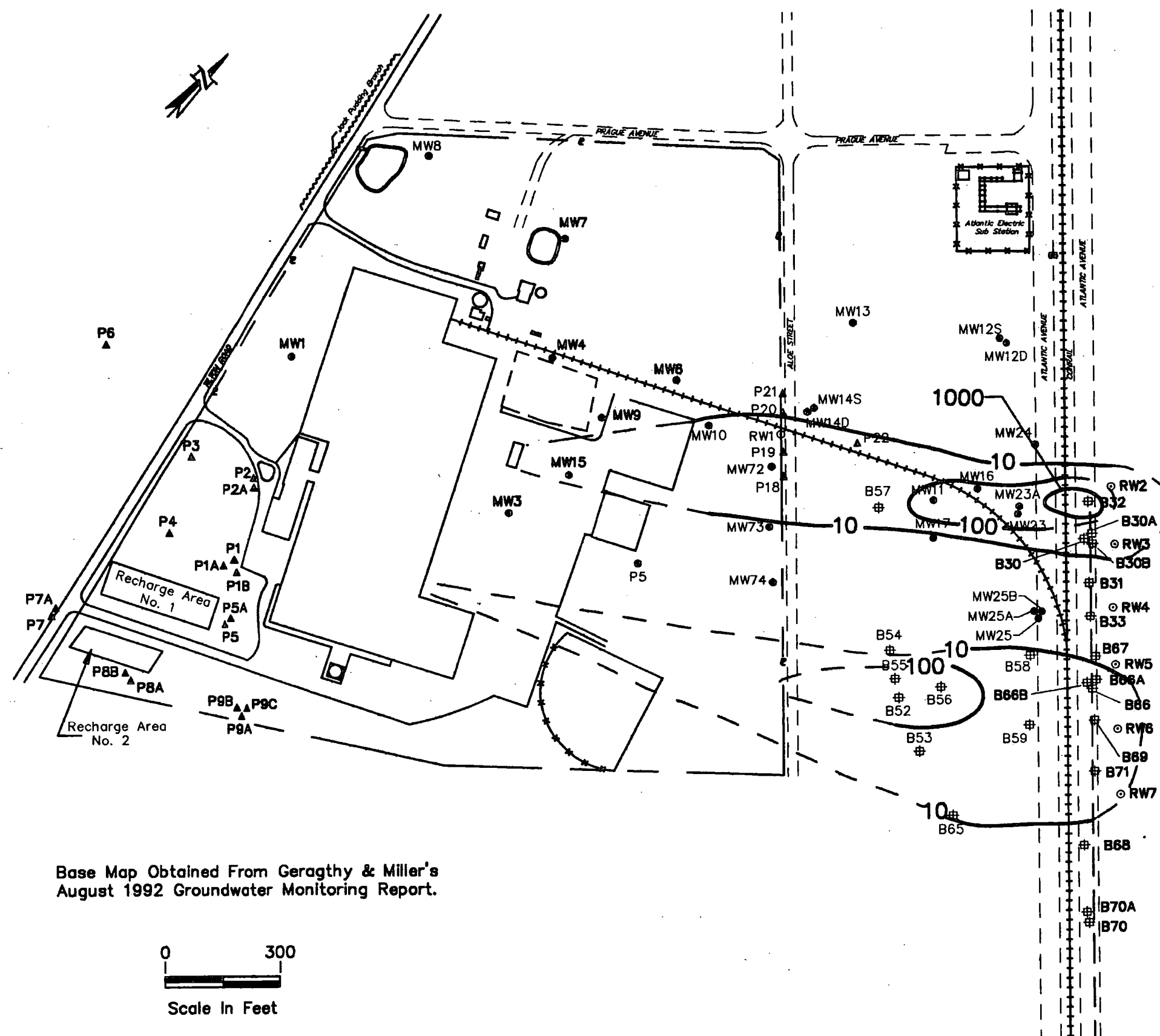
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- LEGEND-**
- B65 # LOCATION OF MONITORING WELL
  - RW5 ○ LOCATION OF RECOVERY WELL
  - MW25 ● LOCATION OF PIEZOMETER
  - P9B ▲ LOCATION OF WELL POINT
  - 10- LINE OF EQUAL WATER-LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL (DASHED LINES INFERRED)

**EXTENT OF TRICHLOROETHENE  
IN GROUDNWATER  
FEBRUARY 10 AND 11, 1992**

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POMONA, NEW JERSEY



Base Map Obtained From Geraghty & Miller's  
August 1992 Groundwater Monitoring Report.

0 300  
Scale In Feet

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091592

# **EXTENT OF TRICHLOROETHENE IN GROUDN WATER MAY 11 AND 12, 1992**

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